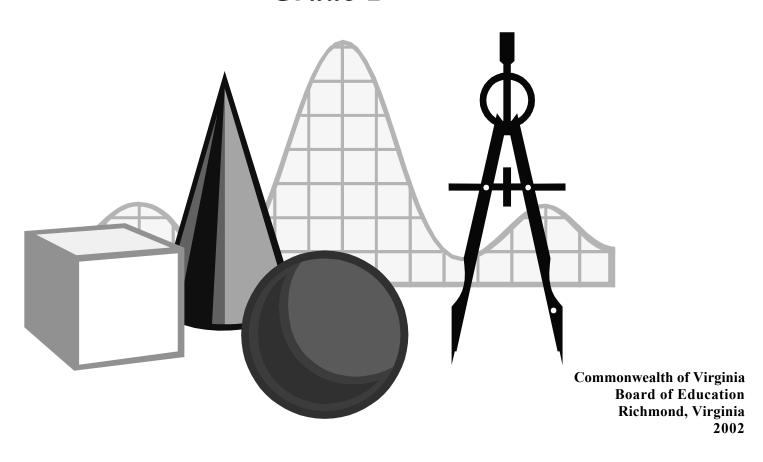
MATHEMATICS STANDARDS OF LEARNING SAMPLE SCOPE AND SEQUENCE

Grade 1



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The Mathematics Standards of Learning Sample Scope and Sequence and the Mathematics Standards of Learning Curriculum Framework can be found in a PDF and Word file format on the Virginia Department of Education's Web site at http://www.pen.k12.va.us.

Preface

As an additional resource to help school divisions develop curricula aligned to the 2001 Mathematics Standards of Learning, the Virginia Department of Education has developed sample scope and sequence documents in kindergarten through grade eight and in core high school courses. These sample documents provide guidance on how the essential knowledge and skills that are identified in the Standards of Learning and the Standards of Learning Curriculum Framework may be introduced to students in a logical, sequential, and meaningful manner.

These sample scope and sequence documents are intended to serve as general guides to help teachers and curriculum developers align their curricula and instruction to support the Standards of Learning. Each sample document is organized around specific topics to help teachers present information in an organized, articulated manner. Also included are correlations to the Standards of Learning for that curricular area for a particular grade level or course, as well as ideas for classroom assessments and teaching resources.

The sample scope and sequence documents are not intended to prescribe how curriculum should be developed or how instruction should be delivered. Instead, they provide examples showing how teachers and school divisions might present to students in a logical and effective manner information that has been aligned with the Standards of Learning. School divisions that need assistance in developing curricula aligned with the Standards of Learning are encouraged to consider the sample scope and sequence guides. Teachers who use the documents should correlate the content identified in the guides with available instructional resources and develop lesson plans to support instruction.

Copies of the sample scope and sequence guides are available at http://www.pen.k12.va.us in both PDF and Microsoft Word formats. These materials are copyrighted, and all rights are reserved. Reproduction of these materials for instructional purposes in Virginia classrooms is permitted.

Introduction

The elementary school sample mathematics scope and sequence is based on the essential knowledge and skills identified in the Mathematics Standards of Learning Curriculum Framework. The sample scope and sequence is indexed by organizing topics reflective of the big ideas contained within the grade level curriculum and correlated to the Mathematics Standards of Learning. It is not intended to be a complete list of all the lessons that need to be taught and mastered during each elementary school grade, yet it sets forth a comprehensive set of instructional expectations that students should master to successfully achieve the grade level standards.

A primary purpose of this document is to offer teachers and curriculum developers one way to sequence and focus their curricula. Teachers may restructure the organizing topics into an instructional program that is inclusive, but better aligned with the available instructional resources (e.g., textbooks, supplemental resource materials, and technological support materials). Once the instructional materials for a scope and sequence are identified, teachers should give consideration to an alignment of the instructional time for each of the topics contained within an assessment reporting category or to the weight of the reporting category.

Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well. The resources section included in the sample scope and sequence document provides a list of manipulatives that may be used in the instructional lessons for the development of the concepts related to the content standards. It also includes page references to the Mathematics Curriculum Framework where instructional strategies and further information can be found for teaching the particular concepts and skills. Additionally, within the resource area, staff development resource documents produced by the Department of Education are listed and can be found on the Department of Education's Web site at www.pen.k12.va.us.

Assessments should support the learning of important mathematics and provide useful feedback to both teachers and students. The classroom assessment methods section in this sample scope and sequence lists a few types of the tests, tasks, and observations that should be used in assessing the student's progress. When teachers select assessment methods, they should ensure that all students have the opportunity to clearly and completely demonstrate what they know and are able to do. Whether the focus is on formative assessment aimed at guiding instruction, or on summative assessment of the student's knowledge, it is important that the teacher have a strong understanding of the mathematics being assessed and the skills to make valid inferences about a student's knowledge and understanding.

The content of the Mathematics Standards of Learning supports five goals for students: becoming mathematical problem solvers, communicating mathematically, reasoning mathematically, making mathematical connections, and representing mathematical ideas. These goals provide a framework for students to learn with understanding, actively building new knowledge from experience and prior knowledge. Therefore, throughout the study of mathematics, students should be encouraged to talk about mathematics, to use the language and symbols of mathematics, to discuss problems, to solve various types of problems in a variety of contexts, and to develop the competence and confidence in themselves as a mathematics student.

The Sample Mathematics Standards of Learning Scope and Sequence should serve as a resource tool for teachers and administrators for developing effective curricula, instruction, and classroom assessment. The degree of success that students have with the Mathematics Standards of Learning will depend upon the school division's implementation of an instructional program that is aligned with the Mathematics Standards of Learning.

| Organizing Topics | Grade K | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 |
|---------------------------------------|---------|------------|---------|---------|---------|---------|
| Whole Numbers: | K.1 | 1.1 | 2.1 | 3.1 | 4.1 | |
| Representations & Relationships | K.2 | 1.2 | 2.2 | 3.2 | | |
| • | K.3 | 1.3 | 2.3 | 3.3 | | |
| | K.4 | 1.4 | 2.5 | | | |
| | K.5 | 1.5 1.7 | | | | |
| Whole Number Operations & Estimation: | K.6 | 1.8 | 2.6 | 3.4 | 4.5 | 5.3 |
| Addition and Subtraction | | 1.9 | 2.7 | 3.8 | 4.6 | |
| | | | 2.8 | | | |
| | | | 2.9 | | | |
| | | | 2.10 | | | |
| | | | 2.26 | | | |
| Whole Number Operations & Estimation: | | | | 3.4 | 4.7 | 5.3 |
| Multiplication and Division | | | | 3.9 | 4.8 | 5.5 |
| | | | | 3.10 | | |
| Decimals: | | | | 3.7 | 4.2 | 5.1 |
| Representations & Relationships | | | | 3.12 | 4.4 | 5.2 |
| Decimal Operations & Estimation: | | | | 3.12 | 4.9 | 5.4 |
| Addition and Subtraction | | | | | | |
| Decimal Operations & Estimation: | | | | | | 5.4 |
| Multiplication and Division | | | | | | 5.6 |
| Fractions: | | 1.6 | 2.4 | 3.6 | 4.2 | 5.2 |
| Representations & Relationships | | | | 3.11 | 4.3 | |
| | | | | 3.5 | | |
| Fraction Operations & Estimation: | | | | | 4.9 | 5.7 |
| Addition and Subtraction | | | | | | |
| Measurement: | K.6 | 1.10 | 2.11 | 3.13 | | |
| Money | K.7 | | | | | |
| Measurement: | K.8 | 1.12 | 2.12 | 3.14 | 4.11 | 5.11 |
| Length | K.10 | | | | | |

| Organizing Topics | Grade K | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 |
|---|---------|---------|---------|---------|----------|-----------|
| Measurement: | K.8 | 1.12 | 2.15 | 3.14 | 4.10 | 5.11 |
| Weight/Mass | K.10 | 1.14 | | | | |
| Measurement: | | 1.13 | 2.17 | 3.14 | 4.12 | 5.11 |
| Volume (Liquid) | | | | | | |
| Measurement: | K.8 | | 2.19 | 3.17 | | 5.11 |
| Temperature | K.10 | | | | | |
| Measurement: | K.8 | 1.11 | 2.16 | 3.15 | | 5.12 |
| Time | K.9 | | 2.18 | 3.16 | | |
| Measurement: | | | 2.12 | | 4.13 | 5.8 |
| Perimeter, Area, Volume, Circumference | | | 2.7 | | | 5.9 |
| | | | 2.13 | | | 5.10 |
| | | | 2.14 | | | 5.11 |
| Geometry: | K.11 | 1.16 | 2.22 | 3.18 | 4.14 | 5.13 |
| Two-Dimensional (plane) | K.12 | 1.17 | | 3.19 | 4.15 | 5.14 |
| | | | | | 4.16 | 5.15a |
| Geometry: | | | 2.22 | 3.18 | 4.17a, b | 5.16 |
| Three-Dimensional (solid) | | | 2.20 | | | |
| Geometry: | | | 2.21 | 3.20 | 4.17c | 5.15b, c, |
| Transformations | | | | | | d, e |
| Geometry: | K.13 | 1.15 | | | 4.18 | |
| Spatial Relationships | | | | | | |
| Statistics: | K.14 | 1.18 | 2.23 | 3.21 | 4.20 | 5.18 |
| Collect, Organize, Display, Analyze and | K.15 | 1.19 | | 3.22 | | 5.19 |
| Interpret Data | | | | | | |
| Probability | K.16 | | 2.24 | 3.23 | 4.19 | 5.17 |
| Patterns and Functions: | K.17 | 1.20 | 2.25 | 3.24 | 4.21 | 5.20 |
| Representations & Relationships | K.18 | 1.21 | | | | |
| Algebra: | | | 2.26 | 3.25 | 4.22 | 5.21 |
| Representations & Relationships | | | | | | 5.22 |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources | | | | | | |
|--|--|----------------|---|---|--------|------|---------------------------------------|---------------------------------------|---------------------------------------|---|
| Whole Numbers: Representations & Relationships | The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to: | | Classroom Observations | Manipulatives: base-10 materials, | | | | | | |
| | Count by rote from 1 to 100. Write numerals for the numbers 1 to 100. Count a randomly placed collection of objects containing between 1 and 100 items and write the corresponding numeral. | 1.1 | Teacher InterviewsStudent Demonstrations | place value charts, Digi-Blocks, cubes, linking cubes, counters, 10-frames, bean sticks, color tiles, | | | | | | |
| | Group a collection of objects into sets of tens and ones. Write the numeral that corresponds to the total number of objects in a given collection of objects that have been grouped into sets of tens and ones. | 1.2 | Quizzes and Tests | nun | number | numl | Quizzes and Tests | Quizzes and Tests | Quizzes and Tests | Cuisenaire Rods, number cards, money, calculators |
| | Count by ones, fives, and tens to 100, using concrete objects, such as counters, connecting cubes, pennies, nickels, and dimes. | 1.3 | | | | | | | | |
| | Skip count orally by fives and tens to 100. Count by twos to 20, using concrete objects, such as counters, connecting cubes, and pennies. | | | | | | | | | |
| | Skip count orally by twos to 20.Count backward by ones from 20. | | | | | | | | | |
| | Write numerals for the numbers 0 through 100, using correct number formation. Identify or write a numeral for numbers 0 through 100 when presented out of sequence. | 1.4 | | | | | | | | |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|-------------------------------------|---|----------------|--|------------------|
| Whole Numbers: Representations & | Count an ordered set of objects, using the ordinal number words <i>first</i> through <i>tenth</i> . | 1.5 | | |
| Relationships (cont'd) | Identify the ordinal positions, first through tenth, using an ordered set of objects. | | | |
| | Identify the ordinal positions, first through tenth, using an ordered set of objects presented in lines or rows from | | | |
| | -left-to-right; | | | |
| | -right-to-left; | | | |
| | -top-to-bottom; and | | | |
| | -bottom-to-top. | | | |
| | | | | |
| | Select a reasonable magnitude for a given set from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, and 500 jelly beans in jars) in a familiar problem situation. | 1.7 | | |
| | Given a familiar problem situation involving magnitude, explain why a particular estimate was chosen as the most reasonable from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral. | | | |
| | | | | |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|---------------------------------------|--|----------------|---|--|
| Whole Number Operations & Estimation: | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: | | Classroom Observations | Manipulatives: base-10 |
| Addition and Subtraction | Identify + as a symbol for addition and – as a symbol for subtraction. Recall and state orally the basic addition facts for sums to 10 or less and the corresponding subtraction facts. Recall and write the basic addition facts for sums to 10 or less and the corresponding subtraction facts, when addition or subtraction problems are presented in either horizontal or vertical written format. | 1.8 | Teacher Interviews Student Demonstrations Quizzes and Tests | materials, place value charts, Digi-Blocks, cubes, linking cubes, counters, 10-frames, bean sticks, color tiles, Cuisenaire Rods, number cards, money, calculators |
| | Interpret and solve oral or written story and picture problems involving one-step solutions, using basic addition and subtraction facts (sums to 10 or less and the corresponding subtraction facts). Identify a correct number sentence to solve an oral or written story or picture problem, selecting from among basic addition and subtraction facts. | 1.9 | | |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|-----------------------|--|----------------|--|--|
| Measurement: Money | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: | | Classroom Observations | Manipulatives: money |
| | Identify the value of a nickel, a dime, and a quarter in terms of pennies. | 1.10 | ■ Teacher Interviews | |
| | Recognize the characteristics of pennies, nickels, and dimes (e.g., color, size). | | Student Demonstrations | |
| | Identify the value of a collection of pennies, nickels, and dimes whose total value is 100 cents or less. | | Quizzes and Tests | |
| | • Count by ones to determine the total value of a collection of pennies whose total value is 100 cents or less. | | | |
| | Count by fives to determine the total value of a collection of nickels whose total value is 100 cents or less. | | | |
| | • Count by tens to determine the total value of a collection of dimes whose total value is 100 cents or less. | | | |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|--|---|----------------|---|--|
| Fractions: Representations & Relationships | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Represent a whole to show it having two equal parts. Represent a whole to show it having four equal parts. Identify and model one-half and one-fourth of a whole, using region/area models (e.g., pie pieces, pattern blocks, geoboards, drawings); and measurement models (e.g., cuisenaire rods, connecting cubes, fraction strips, drawings). | 1.6 | Classroom Observations Teacher Interviews Student Demonstrations Quizzes and Tests | • Manipulatives: fraction circles, pie pieces, pattern blocks, geo-boards, Cuisenaire rods, connecting cubes, fractions strips |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|------------------------|---|----------------|---|--|
| Measurement: Length | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Measure the length of objects, using nonstandard units (e.g., connecting cubes, paper clips, erasers). | 1.12 | Classroom Observations Teacher Interviews Student Demonstrations Quizzes and Tests | Manipulatives: pencils, paper clips, beans, Unifix cubes |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|-----------------------------|--|----------------|---|---|
| Measurement: Weight/Mass | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Measure the weight of objects, using nonstandard units (e.g., paper clips, bean bags, cubes). | 1.12 | Classroom ObservationsTeacher Interviews | Manipulatives: balance scale, objects |
| | Compare the weights of two objects, using the terms <i>lighter</i> , <i>heavier</i> , or <i>the same</i> , by using a balance scale. | 1.14 | Student Demonstrations Quizzes and Tests | |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|---------------------------------|---|----------------|---|--|
| Measurement: Volume (Liquid) | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Compare the volumes of two containers to determine if the volume of one is greater than, less than, or the same as the other, using nonstandard units of measure (e.g., a spoonful, scoopful, or teacupful). Compare the volumes of two containers to determine if the volume of one is greater than, less than, or the same as the other by pouring the contents of one container into the other | 1.13 | Classroom Observations Teacher Interviews Student Demonstrations Quizzes and Tests | Manipulatives: spoons, scoops, plastic containers measuring various quantities |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|---------------------|--|----------------|---|--|
| Measurement: Time | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Tell time shown on an analog clock to the half hour. Tell time shown on a digital clock to the half hour. Match a written time to the time shown on a digital or analog clock to the half hour. | 1.11 | Classroom Observations Teacher Interviews Student Demonstrations Quizzes and Tests | Manipulatives: analog play clocks, digital clocks, calendars |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|---|---|----------------|---|---|
| Geometry: Two-Dimensional (plane) | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Draw triangles, squares, rectangles, and circles. Describe triangles, squares, and rectangles by the number of sides, corners, and square corners. Describe circles. Identify the name of the shape when given information about the number of sides, corners, and/or square corners. | 1.16 | Classroom Observations Teacher Interviews Student Demonstrations Quizzes and Tests | Manipulatives: geometric shapes, pattern blocks, attribute blocks |
| | Identify representations of circles, squares, rectangles, and triangles in the environment at school and home and tell why they represent those shapes. Describe representations of circles, squares, rectangles, and triangles in the environment (e.g., "I know it's a rectangle because it looks like a door, and I know that a door is a rectangle."). | 1.17 | | |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|---------------------------------|---|----------------|---|---|
| Geometry: Spatial Relationships | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Identify the spatial relationships of objects, using the terms near, far, close by, below, above, up, down, beside, and next to. | 1.15 | Classroom Observations Teacher Interviews Student Demonstrations Quizzes and Tests | Manipulatives: objects, pattern blocks, attribute blocks, magazine pictures, drawings |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|---------------------|---|----------------|---|---|
| Statistics | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Investigate various forms of data collection, including counting and tallying, informal surveys, observations, and voting. Identify and describe various forms of data collection in his or her world (e.g., recording daily temperature, lunch count, attendance, and favorite ice cream.) | 1.18 | Classroom Observations Teacher Interviews Student Demonstrations Quizzes and Tests | Manipulatives: objects, one-inch graph paper DOE Probability and Statistics for Elementary Teachers Staff Development Guide |
| | Demonstrate the meaning of the terms <i>more</i>, <i>less</i>, <i>fewer</i>, <i>greater than</i>, <i>less than</i>, and <i>equal to</i>, using concrete materials. Compare one category to another in a graph, indicating which has more or which has less. Interpret information displayed in object graphs and picture graphs, using the words <i>more</i>, <i>less</i>, <i>fewer</i>, <i>greater than</i>, <i>less than</i>, and <i>equal to</i>. Find answers to questions, using graphs (e.g., "Which category has more?" "Which category has less"). | 1.19 | | |

| Organizing Topic | Essential Knowledge and Skills | Related SOL | Sample Classroom Assessment Methods | Sample Resources |
|---|--|----------------|--|--|
| Patterns and Functions: Representations & Relationships | The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to: Sort and classify objects into appropriate subsets (categories) based on one or two attributes, such as size, shape, color, or thickness. | 1.20 | Classroom ObservationsTeacher InterviewsStudent | Manipulatives: attribute Blocks, Pattern Block, colored macaroni, colored cubes, |
| | Recognize the pattern in a given rhythmic, color, shape, or numerical sequence. Describe the pattern in a given rhythmic, color, shape, or numerical sequence. Extend a pattern, using manipulatives, geometric figures, numbers, or calculators. Create a repeating or growing pattern, using manipulatives, geometric figures, numbers, or calculators (e.g., the growing patterns 2, 3, 2, 4, 2, 5, 2, 6, 2,). Create an arithmetic number pattern, using a calculator (e.g., when skip counting by fives, use the constant feature on the calculator by pressing 5 + 5 = = = to produce the pattern 5, 10, 15, 20,). | 1.21 | Demonstrations Quizzes and Tests | colored tiles, linking blocks, calculators DOE Patterns, Functions and Algebra for Elementary Teachers Staff Development Guide |